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SOME NEW SPECIES AND A NEW GENUS OF DELTOCEPHALOID LEAFHOPPERS (HOMOPTERA, CICADELLIDAE)

R. H. BEAMER and L. D. TUTHILL *

In working over recent additions to the Snow Entomological Collection we have found a number of new species belonging to the genera formerly included in **Deltocephalus.** They are described in the following pages. All types are in the Snow Entomological Collection at the University of Kansas, Lawrence, except those otherwise designated. Thanks are due Doctor E. D. Ball of the University of Arizona for lending us types and specimens.

1. **Alapus marcidus** n. sp.

(Plate I Figs. 1, 1a)

Resembling **Alapus fraternus** (Ball) but with posterolateral margins of male plates shrunken in appearance and with distinct female genitalia. Length 3.5 to 4 mm.

Color: Grayish white with definite tawny tinge. Vertex with two prominent, fuscous dashes at apex, posteriorly converging, frontal arcs showing on margin; median triangular spot before ocelli, and four quadrate spots on disc, fuscous. Pronotum irregularly flecked with fuscous. Elytra with veins light, irregularly margined with fuscous and prominent median spot. Face fuscous with very definite light arcs mesally incomplete. Venter tawny, flecked with fuscous.

Structure: Vertex about one-third longer than width between eyes. Elytra longer than abdomen in male, slightly exceeded by pygofer in female.

External genitalia: Last ventral segment of female two and one-half times longer than preceding; posterior margin with two large lateral lobes, between these, three almost identical notches, outer ones with heavy black margins. Male valve acute, about six times longer than last ventral segment. Plates broader than valve at base.

* Contribution from Department of Entomology University of Kansas, Lawrence, Kansas.

about one-fourth longer than valve, almost parallel margined length of valve, rapidly narrowing to blunt apices, outer margin from point opposite apex of valve with whitish withered appearance. Pygofer exceeding plates by slightly more than one-fourth their length, with prominent tumosity opposite apex of valve. Black tip of styles visible at apex of plates.

Internal genitalia: Paired apical processes of pygofer about equal in length, slightly curved ventrally, outer one smooth, lamellate, slightly curving around inner; latter cylindrical, about half as wide as outer, with prominent reticulations and sharp apex.

Holotype, male, allotype, female, Bradford, Florida, July 31, 1930, L. D. Tuthill; 12 male and 12 female paratypes same data; 2 male and 6 female paratypes Branford, Florida, July 31, 1930, P. W. Oman.

2. **Flexamia decora** n. sp.

(Plate I Figs. 2, 2a.

Resembling **Flexamia flexulosa** (Ball) but larger, more definitely marked, with mesal notch in male plates occupying one-fifth their total length and male pygofer with slight keel instead of laterally flattened as in **F. flexulosa** (Ball). Length 3.75 to 4 mm.

Color: Light cinereous with fuscous markings. Vertex with two short, parallel, fuscous dashes at apex; orange line on lateral margins; two fuscous blotches at base. Pronotum with six longitudinal vittae. Elytra with veins lighter, irregularly margined with fuscous except claval veins which are uniformly bordered by distinct narrow lines. Face black on upper half, remainder white.

Structure: Vertex one-fifth longer than wide, lateral margins slightly rounded. Elytra shorter than abdomen.

External genitalia: Female last ventral segment three times as long as preceding, posterior margin slightly excavated, medialy produced into an irregular lobe with lateral teeth and mesal notch. Male valve almost three times as long as last ventral segment. Plates as broad as valve at base tapering to slender tips apically, mesally notched one-fifth total length. Pygofer rounded with median keel, long, extending beyond plates length of valve.

Holotype, male, allotype, female, 7 male and 16 female paratypes, Walden, Colorado, August 20, 1931,

R. H. Beamer; 1 male paratype, Northgate, Colorado, August 20, 1931, R. H. Beamer; 1 male paratype, Walden, Colorado, August 20, 1931, J. O. Nottingham; one male, Pingree Park, Col. Aug. 22, 1931, R. H. Beamer.

3. **Flexamia doeringae** n. sp.

(Plate I Figs. 3, 3a)

Resembling **Flexamia pectinata** (Osborn and Ball) but with much sharper vertex and last ventral segment of female produced into two very long median lobes with notch on lateral margins; male plates broader and with lateral margins rounded. Length 3.5 to 4 mm.

Color: Lighter than **F. pectinata** (Osborn and Ball) with the dark markings somewhat more definite. Vertex with circular ring at apex; interrupted transverse band before eyes and blotch on base at each side fuscous; marginal lines orange. Elytra grayish white, nervures pale margined with fuscous. One more cross vein to costa in most specimens than in **F. pectinata.** Face margined with fuscous to below eyes, marked with white arcs, leaving a light triangle on remainder of face.

Structure: Vertex one-half longer than width between eyes, very acutely angled. Elytra usually longer than abdomen.

External genitalia: Posterior margin of last ventral segment of female deeply concave, mesal third produced caudad into two projections broad at base, mesally contiguous and broadly notched on lateral margins. Male valve triangular, more than twice as long as last segment; plates more than twice as long as valve, about same width at base, slightly tapering, broadly rounded at tip.

Holotype, female, Santa Rita Mts., Arizona, July 17, 1932, R. H. Beamer; allotype, male, Baboquivari Mts., Arizona, July 19, 1932, R. H. Beamer; 5 female and 11 male paratypes, same data as holotype; 2 male paratypes same data as allotype; 1 male paratype Sabino Canyon, Arizona, July 14, 1932, R. H. Beamer; 3 male, 2 female paratypes, Huachuca Mts., Arizona, July 8, 1932, R. H. Beamer.

4. **Flexamia modica** n. sp.

(Plate I Figs. 4, 4a)

Resembling **Flexamia decora** Beamer and Tuthill but smaller, lighter in color, vertex sharper with straight lateral margins and distinct genitalia. Length 3 to 4 mm.

Color: General ground color milky white with fuscous markings. Vertex with prominent U-shaped black mark on apex, narrow fuscous line on margin, mesal suture line prominent to apical mark, pair of transverse dashes between anterior curves of eyes, and pair of indistinct, parallel vittae from inner margin of these to base. Pronotum with six indistinct longitudinal vittae. Scutellum with very prominent spot near each basal angle. Elytra with veins narrowly fuscous margined except reflexed veinlets to costa: with prominent fuscous spot at first cross nervure. Upper half of face black with light arcs, remainder of face light. Venter light.

Structure: Vertex acute, one-half longer than width between eyes, lateral margins straight. Elytra usually exceeding abdomen.

External genitalia: Female last ventral segment three times as long as preceding, posterior margin straight to a well developed median lobe, slightly notched apically. Male valve four times as long as last ventral segment, bluntly angled; plates as broad as valve at base, more than twice as long as valve, rounding to sharp apices, mesally excavated on distal fourth, with prominent marginal row of large spines. Pygofer extending beyond plates one and one-half times length of valve.

Internal genitalia: Oedagus in lateral view with sides of shaft almost parallel; three processes at tip, of approximately same length, median one almost straight and much narrower than laterals, latter flattened with one margin serrate, teeth about half as large as in **F. decora** Beamer and Tuthill.

Holotype, male, allotype, female, 12 male and 26 female paratypes, Alamagordo, New Mexico, June 30, 1932, R. H. Beamer.

5. **Flexamia serrata** n. sp.
(Plate I Figs. 5, 5a)

Near **Flexamia inflata** (Osborn and Ball) but may be separated by the white triangle of face reaching to tip of vertex, by difference of posterior margin of last ventral segment of female and truncate male plates. Length 4 to 4.5 mm.

Color: General color dirty gray. Vertex with two prominent apical dashes; fuscous marks indistinct. Nervures of elytra irregularly fuscous margined. Face

with four to five pairs of fuscous arcs parallel with margin of vertex; white triangle of face reaching tip of vertex.

Structure: Vertex one-fifth longer on middle than width between eyes. Elytra shorter than abdomen in female slightly longer in male.

External genitalia: Last ventral segment of female more than twice as long as preceding. Posterior margin excavated with a median lobe extending slightly beyond marginal line, mesally notched and with from one to three teeth on either margin. Male valve triangular; about three times as long as last segment; plates broad, about twice as long as valve; very slightly narrowing to broadly rounded apices, mesally diverging on apical fifth. Pygofer exceeding plates their length.

Holotype, female, allotype, male, and one pair of paratypes, Merritt, British Columbia, August 3, 1931, R. H. Beamer.

6. **Latalus curtus** n. sp.
(Plate I Figs. 6, 6a)

Resembles **Latalus sayi** (Fitch) but smaller and last ventral segment of female sinuately excavated instead of smooth. Length 2.5 to 3 mm.

Color: Cinereous, heavily infuscated. Vertex with pair of triangles at apex, large pair of irregular spots on disc touching lateral margin, another pair at base, indistinct fuscous. Pronotum with four prominent longitudinal fuscous lines. Elytra with veins light, heavily but irregularly margined with fuscous. Venter dark with light mottling.

Structure: Vertex slightly longer on middle than width between eyes. Elytra longer than abdomen in male, shorter in female.

External genitalia: Female last ventral segment half again as long as preceding; posterior margin deeply sinuate. Male valve as long as preceding segment; bluntly angled. Plates as broad as valve at base, two and one-half times as long as valve, roundingly narrowed for two-thirds their length, almost parallel margined to bluntly rounded apices.

Internal genitalia: Oedagus with shaft of medium size, slightly curved dorsally, in dorsal view swollen to

twice its width on apical fourth, with short retrorse barb on either side of swollen portion.

Holotype, female, allotype, male, 33 male, and 34 female paratypes, Merritt, British Columbia, August 3, 1931, R. H. Beamer.

7. **Latalus mundus** n. sp.

(Plate I Figs. 7, 7a)

Resembling **Latalus curtus** Beamer and Tuthill but last ventral segment of female distinctly produced, male plates sharp and internal genitalia of male distinct. Length 2.5 to 3 mm.

Color: Cinereous, heavily infuscated. Vertex with pair of triangles at apex, large pair of irregular spots on disc touching lateral margin, another pair at base indistinct. Pronotum with indistinct longitudinal vittae. Elytra with veins light, heavily margined with fuscous. Face dark with light arcs. Venter dark, segments with red margins.

Structure: Vertex slightly longer mesally than width between eyes. Elytra shorter than abdomen in females, longer in males.

External genitalia: Female last ventral segment almost twice as long as preceding, lateral angles prominent, median two-thirds of posterior margin strongly produced into an ovate lobe. Male valve almost twice as long as preceding segment, obtusely angled. Plates as broad as valve at base, twice as long, rapidly narrowing to rather sharp apices, as long as pygofer.

Internal genitalia: Oedagus with shaft parallel-sided, slender, curved dorsally at right angles on apical third.

Holotype, male, allotype, female, Grand Teton National Park, Wyoming, August 18, 1931, R. H. Beamer. Paratypes as follows: 3 males and 2 females same data; 1 male and 1 female, Merrit, British Columbia, Canada, August 3, 1931, R. H. Beamer; 1 male and 1 female, Bozeman, Montana, August 13, 1931, R. H. Beamer; 9 males and 6 females, Yellowstone Park, Frying Pan Lake, August 15, 1931, R. H. Beamer; 1 male, Craig, Colorado, June 30, 1931, R. H. Beamer.

8. **Latalus uncinatus** n. sp.

(Plate I Figs. 8, 8a)

Resembling **Latalus curtus** Beamer and Tuthill but larger, apices of male plates truncate instead of rounded.

Length 3 to 3.5 mm.

Color: General ground color tawny to cinereous heavily marked with fuscous. Vertex with pair of triangles at apex, small spot on margin near eyes, large triangular spots on disc, and small indistinct spots at base fuscous. Pronotum with indistinct longitudinal vittae. Elytra subhyaline, part of veins white, others fumose, more or less infuscated, especially apical cells. Face fuscous with incomplete light arcs. Venter dark.

Structure: Vertex slightly longer than width between eyes. Pronotum equalling vertex in length. Length of elytra variable.

External genitalia: Female last ventral segment slightly longer than preceding, posterior margin regularly sinuate forming four almost equal, flat lobes. Male valve slightly longer than preceding segment, obtuse. Plates slightly narrower than valve at base, roundingly narrowed to outer third, then parallel margined to truncate tips, apices about half as wide as width at base, equalling pygofer in length.

Internal genitalia: Oedagus very broad in any view, dorsally about half as wide as long, slightly curved dorsally, apex broadened at outer corners. A pair of slender, curving, retrorse, processes at apex.

Holotype, male, and allotype, female, Santa Rita Mts., Arizona, July 17, 1932, R. H. Beamer. Paratypes as follows: 11 females and 3 males, same data as holotype; 2 females, 1 male, Las Cruces, New Mexico, July 1, 1932, R. H. Beamer; 2 males, Huachuca Mts., Arizona, July 8, 1932, R. H. Beamer; 5 males, 5 females, Santa Rita Mts., Arizona, 1930 and 1931, E. D. Ball; one female, Santa Catalina Mts., Arizona, July 24, 1932, E. D. Ball; 4 females and 1 male, Tucson, Arizona, 1929, E. D. Ball; 1 female and 10 males, Santa Rita Mts., Arizona, June 27, 1933, P. W. Oman; 3 females and 5 males, Cloudcroft, New Mexico, June 7, 1933, P. W. Oman.

Paratypes in collection of E. D. Ball and United States National Museum.

9. **Latalus vagus** n. sp.

(Plate I Fig. 9)

Resembling **Latalus sayi** (Fitch) but much smaller, head more conical, and markings quite different and distinct genitalia. Length of male, 2 mm.

Color: Cinereous marked with fuscous. Vertex with pair of triangles at apex, prominent spot mesad

each ocellus; pair of indistinct dashes near base, fuscous. Pronotum and scutellum indistinctly mottled with fuscous. Elytra subhyaline, veins white irregularly fuscous margined. Face light brown with incomplete lighter arcs. Venter fuscous.

Structure: Head wider than pronotum, vertex conical, half longer than width between eyes. Elytra about equalling abdomen in length.

Genitalia: Male valve slightly more than twice as long as last ventral segment, broadly rounded; plates as broad as valve at base, twice as long, very broad, convexly rounded to blunt apices, slightly exceeded by pygofer.

Holotype, male, one paratype, Tucumcari, New Mexico, June 4, 1933, R. H. Beamer.

This species resembles **Polyamia weedi** (Van Duzee) in many respects but due to the lack of crossveins it is placed in **Latalus.**

10. **Polyamia lobata** n. sp.
(Plate I Figs. 10, 10a)

Resembling **Polyamia compacta** (Osborn & Ball) but slightly larger and last ventral segment of female with very large median lobe. Length 3 mm.

Color: Buff with fuscous markings. Vertex with reflexed arcs of face showing, pair of light dashes at apex, spot on lateral margin midway between these and eye, transverse band not reaching eyes, mesally deflected half way to base, two pairs of converging arcuate dashes near base, fuscous. Pronotum with six broad fuscous vittae, a mesal pair of small black spots near anterior margin, others near eyes. Scutellum with fuscous spot in basal angles. Elytra with nervures light, quite regularly margined with fuscous. Venter darker.

Structure: Vertex about as long as width between eyes. Elytra exceeding abdomen in length.

External genitalia: Female last ventral segment almost three times as long as preceding; lateral margins extremely short, posterior margin strongly produced mesally into broad, flat-tipped lobe, underlying membrane lobed on either side. Male valve two and one-half times as long as last ventral segment, slightly concave on lateral margin, rounded posteriorly; plates narrower than valve at base, twice as long as valve, slightly con-

cave to sharp diverging apices.

Holotype, female, allotype, male, two female and three male paratypes, Homestead, Florida, August 9, 1930; R. H. Beamer; one female paratype, Cocoanut Grove, Florida, August 9, 1930, R. H. Beamer.

11. **Polyamia nana** n. sp.

(Plate I Figs. 11, 11a)

Resembling **Polyamia compacta** (Osborn & Ball) but smaller, almost white, male plates much shorter than pygofer and internal genitalia of male quite distinct. Length 2 to 2.5 mm.

Color: White, tinged with yellow on vertex and pronotum. Vertex with reflexed arcs from face on margins; mesally broken transverse band between eyes fuscous; other markings indistinct. Pronotum with pair of prominent black spots behind each eye. Elytra white with veins incompletely fuscous margined; prominent fuscous spot near middle of costa and another half way between this and apex. Face light fuscous with indistinct arcs, remainder of venter tawny.

Structure: Vertex as long as width between eyes, one-fourth longer than pronotum. Lateral margins of pronotum very short. Elytra exceeding abdomen in male, shorter than abdomen in female.

External genitalia: Female last ventral segment about four times as long as preceding; lateral margins almost obsolete exposing large lobes of underlying membrane; median half of posterior margin slightly produced into broad lobe. Male valve about one-fourth longer than last ventral segment, rounded posteriorly; plates slightly longer than valve, as broad as valve at base, tapering to sharp apices, mesally separated from base to touching tips; pygofer exceeding plates by about half their length.

Internal genitalia: Oedagus dorso-ventrally narrowed, sides slightly converging apically; in lateral view base extremely broad, almost quadrangular, shaft with sides rapidly converging to a sharp dorsally bent tip.

Holotype, male, Sanford, Florida, August 4, 1930, R. H. Beamer; allotype, female, Hilliard, Florida, August 31, 1930, R. H. Beamer; 3 male and 4 female paratypes from Waldo, Florida, August 18, 1930, R. H. Beamer; 1 male paratype, Ocala, Florida, August 17, 1930, L. D. Tuthill.

12. **Polyamia tantilla** n. sp.
(Plate I Figs. 12, 12a)

Resembling **Polyamia weedi** (Van Duzee) but much smaller with triangular orange marks on tip of vertex, an orange vitta usually occupying costal plaque and distinct genitalia. Length 2 to 2.5 mm.

Color: Grayish white profusely marked with fuscous. Vertex with two orange triangles at apex, small fuscous spot near margin half way between eye and tip, usual broken transverse line between eyes and pair of posteriorly converging dashes near base. Pronotum with semblance of six longitudinal vittae and arcuate row of fuscous spots near anterior margin. Scutellum with fuscous dash parallel to lateral margin ending in heavy spot in each basal angle. Elytra with veins light, margined with fuscous, usually orange vitta near costal plaque. Venter dark.

Structure: Vertex as long as width between eyes. Elytra as long as or slightly exceeding abdomen.

External genitalia: Female last ventral segment about three times as long as preceding, lateral margins short slightly exposing underlying membrane, posterior margin concave to large median lobe. Male valve small, rounded, about as long as last ventral segment. Plates very slender about four times as long as valve, as wide as valve at base, rapidly narrowing on basal half to about one-third basal width.

Internal genitalia: Oedagus in dorsal view pastinacaform, shallowly bifurcate at tip. In lateral view slender, gradually tapering to dorsally curved tip.

Holotype, female, allotype, male, and 4 male paratypes, Santa Rita Mts., Arizona, July 17, 1932, R. H. Beamer. Other paratypes as follows; 1 male Santa Rita Mts., Arizona, Oct. 8, 1931, E. D. Ball; 1 female Santa Rita Mts., Arizona. July 11, 1932, E. D. Ball; 1 male, 4 females Santa Rita Mts., Arizona, June, 1933, R. H. Beamer; 1 female Mustang Mt., Arizona, June, 1933, R. H. Beamer; 1 female Patagonia, Arizona, June, 1933, R. H. Beamer; 6 females and 2 males Santa Rita Mts., Arizona, June 12, 1933, P. W. Oman; 2 females Patagonia, Arizona, June 24, 1933, P. W. Oman. Paratypes in collection of E. D. Ball and United States National Museum.

13. **Polyamia pulla** n. sp.
(Plate II Figs. 13, 13a)

Resembling **Polyamia weedi** (Van Duzee) but with distinct genitalia. Length 3 mm.

Color: Cinereous heavily marked with fuscous. Vertex with two apical triangles, median spot on lateral margins, mesally broken anteriorly curving band between eyes, two pairs of posteriorly converging dashes at base, fuscous. Pronotum with six longitudinal bands. Scutellum with square spot in each basal angle, and pair of small black mesal spots. Veins of elytra whitish, regularly and heavily margined with fuscous. Venter dark with light mottling.

Structure: Vertex slightly longer than width between eyes. Elytra exceeding abdomen.

External genitalia: Female last ventral segment twice as long as preceding, posterior margin roundingly excavated either side of broad fuscous margined median lobe equalling lateral margin in length. Male valve bluntly angled, twice as long as preceding segment; plates slightly narrower than valve at base, tapering to sharp apices, twice as long as valve, equalling pygofer in length.

Holotype, female, allotype, male, and one male paratype, Homestead, Florida, August 9, 1930, R. H. Beamer.

14. **Polyamia ritana** n. sp.
(Plate II Figs. 14, 14a)

Resembles **Polyamia weedi** (Van Duzee) but larger, darker, more robust species, elytra usually shorter than abdomen and genitalia distinct. Length 3 to 3.5 mm.

Color: Dirty yellow profusely marked with fuscous. Vertex with following fuscous marks: pair of triangles at apex; two small round spots midway between these and eyes; irregular black band between eyes broken mesally; and two large tawny spots cauded this band. Frontal arcs visible from above. Pronotum with faint longitudinal bands. Scutellum with two small black spots near anterior margin and prominent brown one on apex. Elytra with veins lighter, irregularly margined with fuscous. Usually a prominent spot on costal margin near costal plaque, another at first cross nervure. Venter usually dark with light mottling.

Structure: Vertex about as long as width between eyes. Elytra shorter than abdomen.

External genitalia: Female last ventral segment slightly more than twice as long as preceding, very short at lateral margins, roundingly produced, posterior margin with slight undulations and prominent mesal notch. Underlying membrane prominent. Male, last ventral segment angularly excavated, valve roundingly obtuse, plates as broad as valve at base, about twice as long as valve, concavely attenuate to sharp apices.

Holotype, female, allotype, male, 11 female, and 16 male paratypes, Santa Rita, Mts., Arizona, July 17, 1932, R. H. Beamer; one female paratype Huachuca Mts., Arizona, July 8, 1932, R. H. Beamer.

15. **Polyamia santana** n. sp.
(Plate II Figs. 15, 15a)

Slightly resembling **Polyamia micaria** (Ball) but without definite markings and with very distinct female genitalia. Length 3 to 3.5 mm.

Color: Luteous with indistinct markings. Vertex pale with indistinct markings. Pronotum unmarked. Two prominent spots at base of scutellum fuscous. Veins of elytra lighter with irregular fuscous margins. Prominent fuscous spot on clavus near claval suture. Venter darker.

Structure: Vertex as long as width between eyes. Elytra exceeding abdomen in length.

External genitalia: Female last ventral segment more than twice as long as preceding; lateral margins covering underlying membrane; median half of posterior margin produced into three nearly equal lobes, lateral margins of which cut almost to base of segment. Male, valve three times as long as preceding segment, bluntly angled. Plates slightly narrower than valve at base, one-half as long again, sharply concave to attenuated tips.

Holotype, female, allotype, male, 1 female, 4 male paratypes, Santa Rita Mts., Arizona, July 17, 1932, R. H. Beamer; 2 female paratypes Santa Rita Mts., Arizona, June 27, 1933, P. W. Oman; 1 male Santa Rita Mts., Arizona, June 12, 1933, R. H. Beamer; 1 male, Santa Rita Mts., Arizona, July 11, 1932, E. D. Ball.

Paratypes in collection of E. D. Ball and the United States National Museum.

16. **Polyamia singularis** n. sp.
(Plate II Figs. 16, 16a)

Resembling **Polyamia tantilla** Beamer and Tuthill but with pair of distinctive black triangles on vertex and distinct genitalia. Length 2.5 mm.

Color: Cinereous with fuscous markings. Vertex with light triangles at apex, pair of black spots on each side near margin between eye and tip, another pair of distinctive triangular black spots midway between eyes, and pair of light dashes on each side near base. Scutellum with distinct fuscous spot in basal angles. Elytra with light veins margined with fuscous.

Structure: Vertex about as long as width between eyes. Lateral margins of pronotum almost obsolete. Elytra as long as abdomen. Clavus heavily reticulate.

External genitalia: Female last ventral segment about three times as long as preceding, posterior margin deeply and angularly excavated two-thirds distance to base, small tooth at bottom of excavation. Underlying membrane not visible. Male valve about twice as long as last ventral segment which is deeply concave. Plates as wide as valve at base, about twice as long, lateral margins almost straight, tapering to blunt apices. Pygofer slightly exceeding plates.

Internal genitalia: Oedagus very striking, shaft long and slender practically straight, tip bifurcate, forks very sharp, each one with slender retrorse process about one-third as long as shaft.

Holotype, female, Santa Rita Mts., Arizona, July 17, 1932, R. H. Beamer. Allotype male, and 1 male and 2 female paratypes Mustang Mt., Arizona, June, 1933, R. H. Beamer; other paratypes as follows: 1 female Santa Rita Mts., Arizona, June, 1933, R. H. Beamer; 1 female Granite Dell, Arizona, July, 1933, R. H. Beamer; 1 male Patagonia, Arizona, June, 1933, R. H. Beamer; 1 female Mustang Mt., Arizona, June, 1933, P. W. Oman in United States National Museum.

17. **Polyamia incerta** n. sp.
(Plate II Figs. 17, 17a)

Resembling **Polyamia tantilla** Beamer & Tuthill but

lacking black transverse band on vertex and with distinct genitalia. Length 3 mm.

Color: Cinereous, profusely marked with fuscous. Vertex with two prominent fuscous triangles margined with orange at apex, two small spots near margin, two large irregular spots on disc, and pair of prominent converging dashes near base, fuscous. Pronotum with prominent fuscous longitudinal vittae. Scutellum with prominent fuscous spot in each basal angle, marginally extended to tip, and two incomplete diverging median vittae. Elytra with veins white, irregularly margined with fuscous, numerous fuscous spots, and costa slightly orange. Face dark with incomplete light arcs, venter fuscous.

Structure: Vertex slightly longer than width between eyes. Pronotum one-fourth longer than vertex. Elytra in most specimens exceeding abdomen.

External genitalia: Female last ventral segment slightly longer than preceding, lateral margins short slightly exposing underlying membrane, posterior margin slightly concave to slight median lobe. Male valve as long as preceding segment, obtusely angled. Plates as wide as valve at base, concavely narrowed to sharp apices, about twice as long as valve, slightly exceeding pygofer.

Internal genitalia: Oedagus characteristic in dorsal view. Broad at base, tapering to apical third where it widens abruptly at right angles to shaft, almost straight to deeply bifurcate apex, forks sharp. The sagittate apex of the oedagus definitely separates this species from **P. tantilla.**

Holotype male, and allotype female, Baboquivari Mts., Arizona, Oct., 22, 1931, E. D. Ball; Other paratypes as follows: 4 males and 6 females same data as types; 6 females and 4 males Santa Rita Mts., Arizona, 1933, R. H. Beamer, and 2 males Patagonia, Arizona, 1933, P. W. Oman; 10 males and 10 females Sabino Canyon, Arizona, June, 1933, R. H. Beamer. Types in collection of E. D. Ball, paratypes in Snow Entomological Collection and in United States National Museum.

18. **Polyamia multicella** n. sp.
(Plate II Figs. 18, 18a)

Resembles **Polyamia incerta** Beamer and Tuthill

but lacking large fuscous spots on disc of vertex, with many more cross veins in elytra and distinct internal male genitalia. Length 2.5 mm.

Color: Cinereous marked with fuscous. Vertex with dark arcs of face visible, pair of apical triangles, large spots on margin midway between these and eye, small spot next eye, pair of more or less distinct converging dashes near base, fuscous. Elytra with veins light, regularly margined with fuscous, Face dark with incomplete light arcs. Venter heavily infuscated.

Structure: Vertex about one-fourth longer than width between eyes. Elytra longer than abdomen, appendix present, reticulate throughout.

External genitalia: Female last ventral segment about three times as long as preceding, lateral margin almost wanting, posterior margin roundingly produced. Male valve about same length as preceding segment, obtusely angulate; plates as wide as valve at base, about twice as long, slightly concavely narrowed to sharp apices, strongly curved dorsally, exceeding pygofer in length.

Internal genitalia: Oedagus broad at base, rapidly narrowing near middle to about one-fourth basal diameter, dorsally curved at right angles on outer fourth, ending in slight knob.

Holotype, male, and 1 male paratype, Granite Dell, Arizona, July 30, 1933, R. H. Beamer; allotype, female, Tubac, Arizona, June 25, 1933, R. H. Beamer. Paratypes as follows: 1 male Santa Rita Mts., Arizona, July 17. 1933; 1 male Santa Rita Mts., Arizona, July 11, 1932, E. D. Ball; 1 female, Nogales, Arizona, June 25, 1933; 1 female Huachuca Mts., Arizona, July 8, 1932, R. H. Beamer; 1 male, Santa Rita Mts., Arizona, June 12, 1933, P. W. Oman, in United States National Museum.

19. **Polyamia sabina** n. sp.

(Plate II Figs. 19, 19a)

Resembling **Polyamia nana** Beamer and Tuthill but about half as large, with wings shorter than abdomen and with distinct genitalia. Length 2 mm.

Color: Body stramineous, elytra milky white. Vertex with small light apical triangle bordered by narrow pink line, connected basally to ocelli. Dark

markings of disc indistinct. Pronotum mottled. Elytra with veins yellowish, prominent black spot on costal margin at posterior end of costal plaque. Apical cells partially black.

Structure: Vertex slightly longer than width between eyes. Elytra barely reaching penultimate segment of abdomen. Apical cells shortened.

External genitalia: Female last ventral segment twice as long as preceding, lateral margin short, posterior margin trilobate, median lobe prominent. Male valve broadly rounded. Plates more than twice as long as valve, equalling pygofer, as wide as valve at base, strongly converging half their length then slightly tapering to sharp apices.

Holotype, female, and allotype, male, Sabino Canyon, Arizona, June 22, 1933, R. H. Beamer. Paratypes as follows: 9 males and 10 females same data as types; 1 female same data except collected July 12, 1932; 1 male and 2 females Sabino Canyon, Arizona, June 22, 1933, P. W. Oman; 1 female Nogales, Arizona, June 25, 1933, P. W. Oman. Paratypes in United States National Museum.

20. **Hebecephalus tener** n. sp.

(Plate II Figs. 20, 20a)

Resembling **Hebecephalus blandus** (Gillette) but larger with median tooth of last ventral segment of female longer than lateral lobes, slightly notched mesally. Length 3 mm.

Color: Whitish with light fuscous markings. Vertex with pair of somewhat irregular, broad fuscous vittae arising at apex, extending to base. Four faint, longitudinal vittae on pronotum. Elytra hyaline. Face lightly infuscated with lighter arcs. Venter light in female, dark markings in male.

Structure: Vertex as long as width between eyes. Pronotum about one-third shorter than vertex. Elytra slightly exceeding abdomen, apically narrowed.

External genitalia: Female last ventral segment twice as long as preceding, posterior margin excavated either side of large, straight-sided, median tooth, slightly notched at apex, longer than lateral lobes. Margins of tooth and excavations on either side black margined, giving appearance of two black teeth. Male valve about as long as last ventral segment, plates about

twice as long as valve, slightly convex to roundingly truncate tips, with prominent black spot on disc. Pygofer exceeding plates by almost their length, with sharp ventral notch just posterior to apices of plates, upper parts dark.

Holotype, female, Pingree Park, Colorado, August 20, 1931, P. B. Lawson; allotype, male, 15 female and 7 male paratypes, Pingree Park, Colorado, August 19, 1930, D. A. Wilbur. Holotype and paratypes in Snow Entomological Collection; allotype and paratypes in collection of D. A. Wilbur, Manhattan, Kansas.

21. **Laevicephalus helvus** (DeLong)
(Plate II Fig. 21)

Deltocephalus helvus, DeLong, D. M., Ohio State University, Bul., Vol. II, p. 78, 1926.

The male of this species has apparently never been described. There are, in the Snow Entomological Collection, two females and two males taken together in Grand Teton National Park, Wyoming. One of the males is here described as the allotype of this species:

Resembles female in size and general appearance but with faint fuscous longitudinal vittae on vertex and pronotum.

External genitalia: Valve three times as long as last ventral segment, bluntly angled. Plates as broad as valve at base, slightly more than twice as long as valve, concavely converging to broad apices, with outer angles longer, posterior margins straight. Pygofer one-fourth longer than plates.

Allotype, male, Grand Teton National Park, Wyoming, August 18, 1931, R. H. Beamer. One parallotype same data.

22. **Laevicephalus tritus** n. sp.
(Plates II Figs. 22, 22a)

Resembling **Laevicephalus monticolus** (Gillette & Baker) but with posterior margin of last ventral segment of female with four teeth instead of one and apices of elytra infuscated. Length 3 to 3.5 mm.

Color: Greenish yellow with some fuscous markings. Vertex with pair of oblique fuscous dashes at apex. Pronotum sometimes with faint fuscous longitud-

inal vittae. Elytra subhyaline, veins yellowish, more or less margined with fuscous principally toward apices. Face fuscous with incomplete light arcs. Venter infuscated, lighter than in **L. monticolus.**

Structure: Vertex as long as width between eyes. Elytra exceeding abdomen in length.

External genitalia: Female last ventral segment one and a half times as long as preceding, posterior margin broadly rounding to median third, remainder more or less produced, mesally divided one-third distance to base of segment, another notch on either side, forming four teeth. This portion of segment shining black. Male valve almost twice as long as preceding segment, slightly rounded to blunt tip. Plates wider than valve at base, three times as long, almost straight sided to narrow apices. Pygofer exceeding plates by half their length.

Holotype, female, Chiricahua Mts., Arizona, Aug., 22, 1931, E. D. Ball; allotype, male, Yavapai Co., Arizona, Aug. 9. 1927, R. H. Beamer. Paratypes as follows: 8 females same data as holotype; 2 females Patagonia, Arizona, Sept. 7, 1929, E. D. Ball; 1 male Patagonia, Arizona, July 20, 1930; 2 females Patagonia, Arizona, Sept. 20, 1930, E. D. Ball; 3 females and 1 male, Nogales, Arizona, Aug. 7, 1932, E. D. Ball; 1 male Santa Catalina Mts., Arizona, July 23, 1932, E. D. Ball; 1 male Tucson, Arizona, Oct., 20, 1929, E. D. Ball. Holotype and paratypes in collection E. D. Ball; allotype and paratypes in Snow Entomological Collection.

23. **Laevicephalus auratus (Gill. & Baker)**

Deltocephalus auratus Gillette and Baker, Hemip. Colorado, p. 85, 1895.

The senior author with Doctor E. D. Ball and P. W. Oman collected a nice series of this species, both males and females together, last summer (1933) in Rustlers Park (9000 feet elevation) Chiricahua Mts., Arizona. Oman had taken numerous specimens a few days earlier near Cloud Croft, New Mexico and numerous other specimens were taken in August, high upon the San Francisco Peaks, near Flagstaff, Arizona.

This striking species with the golden yellow male, usually with almost no dark markings and the light grey female usually with dark markings, was named from

two males and one female, the latter apparently lost, with its true identity still in question. The female figured by Sanders and De Long, Penn. Dept. Agri. Gen. Bul. No. 346, Vol. 3, June 1920, No. 15, Tech. ser, No. 1 and again by De Long, Ohio State Univ. Studies Vol. II, 1926, has a last ventral segment so different from the average of the specimens observed that one would be inclined to think they had an undescribed species. A study of the last ventral segment of females from various localities, however, showed some variation in the outline of the posterior margin, starting with forms not far from the original drawing of Gillette and Baker and gradually approaching that of Sanders and De Long. It is possible that specimens from other more northern localities would show a form such as they figured. We have tried to illustrate a specimen midway between the two extremes. Plate II figs. 23, 23a.

24. **Laevicephalus shingwauki** n. sp.
(Plate II Fig. 24)

Resembling **Laevicephalus concinnus** (Sand. and DeL.) but smaller, with wings shorter than abdomen and prominent dorsal black spots on tip of abdomen and two prominent dorsal black spots on tip of abdomen. Length 2.5 mm.

Color: Stramineous with some darker markings. Vertex with two dark, almost parallel, broad vittae, extending across pronotum to anterior portion of scutellum. Elytra slightly smoky, almost transparent. Two large black dorsal spots on tip of abdomen. Venter stramineous. With lateral margins of abdomen fuscous.

Structure: Head wider than pronotum. Vertex slightly longer than width between eyes, one-fifth longer than pronotum, disc flat. Pronotum with lateral margins very short. Elytra shorter than abdomen, exposing last two segments. Wings very much reduced in size, about half as long as claval suture.

External genitalia: Male valve one-third longer than last ventral segment, roundingly angulate. Plates slightly wider than valve at base, twice as long, slightly converging to truncate tips. Pygofer very spiny, exceeding plates by half their length.

Holotype, male and one paratype male, Aitkin, Minn., August 25, 1933, P. B. Lawson. This may prove

to be the male of **Laevicephalus concinnus** (S. & D.) but due to the short elytra and great reduction of the wings and other apparent differences we believe it to be a distinct species.

25. **Deltocephalus valens** n. sp.
(Plate II Figs. 25, 25a)

Resembling **Deltocephalus punctatus** Osborn and Ball but vertex blunter, elytra of male shorter, plates broader and longer, and female last ventral segment without median tooth. Length 3 mm.

Color: General ground color buff. Vertex with two small, apical spots, and two large almost circular spots extending to lateral margins, black. Elytra semi-hyaline, dark color of abdomen giving them a fumose appearance. Face dark with incomplete pale arcs. Venter dark.

Structure: Vertex one-third wider than length at middle. Elytra shorter than abdomen. Appendix very small or wanting.

External genitalia: Female last ventral segment five times as long as preceding, lateral margins not touching pleural pieces, posteriorly rounded with mesal notch. Underlying membrane visible as broad lobes at sides of segment. Male valve three times as long as preceding segment, bluntly angled posteriorly. Plates narrower than valve at base, two and one-half times as long evenly narrowed to very sharp apices.

Internal Genitalia: Shaft of oedagus dorso-ventrally much flattened basally into vane-like structure with long slender process on each side.

Holotype, female, allotype, male, 13 female and 7 male paratypes, Grand Teton National Park, Wyoming, August 18, 1931, R. H. Beamer. Other paratypes as follows: one female and 9 males Walden, Colorado, Aug. 20, 1931, R. H. Beamer; 1 male and 1 female, Northgate, Colorado, Aug. 20, 1931, R. H. Beamer.

26. **Deltocephalus durus** n. sp.
(Plate II Figs. 26, 26a)

Resembling **Deltocephalus valens** Beamer and Tuthill but with black markings of face visible from above, elytra much darker with light veins and distinct genitalia. Length 3 mm.

Color: Stramineous, profusely marked with

fuscous. Vertex with arcs of face showing on lateral margins, pair of triangular spots on apex, pair of large nearly round ones near ocelli and pair of very small ones next eye near base, black. Pronotum with three pairs of longitudinal fuscous vittae. Scutellum with pair of small mesal spots at base, larger one at apex, fuscous. Elytra heavily infuscated, veins white. Face light with incomplete dark arcs. Venter of abdomen mostly dark.

Structure: Head slightly wider than pronotum. Vertex slightly longer than width between eyes, as long as pronotum. Elytra almost equalling abdomen in length in male, slightly shorter in female. Appendix present.

External genitalia: Female last ventral segment slightly more than twice as long as preceding. Posterior margin almost straight. Male valve about four times as long as preceding segment, roundingly obtuse; plates narrower than valve at base, exceeding valve by one-half its length, tapering to sharp apices. Pygofer broader than plates at base, rapidly narrowing to end before tips of plates.

Internal genitalia: Shaft of oedagus long, tapering to a dorsally bent apex with sheath-like structure enclosing basal fourth. No indication of lateral processes such as are found in **Deltocephalus valens** B. & T.

Holotype, male, and allotype, female, and 22 female and 19 male paratypes, Flagstaff, Arizona, Aug. 5, 1933, R. H. Beamer.

This species was swept from San Francisco Mts. at elevation of about 10,000 feet.

Penestirellus new genus

Resembling **Stirellus** but with two cross nervures instead of one. Vertex much longer than wide.

Vertex conically produced; almost twice as long mesally as width between eyes. Ocelli on margin of vertex very close to eyes. Head slightly wider than pronotum. Pronotum about two-thirds as long as vertex, with lateral margins very short. Elytra with two cross nervures, three anteapical cells and without appendix.

Although this genus seems to be most nearly allied to **Stirellus** the two cross nervures in the elytra show a relationship to the Deltocephaloid genera. The shape

and markings of the head are those of **Polyamia** while the venation of the elytra resembles that of **Latalus.**

Type of genus, **Penestirellus catalinus** Beamer and Tuthill n. sp.

Penestirellus catalinus n. sp.

(Plate II Figs. 27, 27a, 27b)

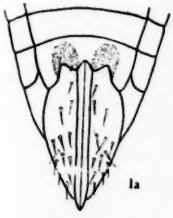
Color: Cinereous with fuscous markings. Vertex with two apical dashes, second pair caudad to these, mesally broken transverse band between anterior points of eyes and pair of prominent basal dashes fuscous. Arcs of face visible on vertex. Anterior half of pronotum with fuscous maculations. Scutellum with fuscous spot in basal angles. Elytra with apical veins fuscous, others white; small spot at apex of clavus fuscous. Face tawny with fuscous arcs. Venter infuscated.

Structure: Length 3 to 4 mm. Vertex conical, almost twice as long mesally as width between eyes; posterior margin deeply excavated. Pronotum as long as width between eyes, lateral margins very short. Elytra shorter than abdomen in female, exceeding abdomen in male. Ovipositor very long as in **Athysanella.**

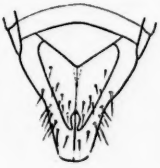
External genitalia: Female last ventral segment slightly shorter than preceding, almost black except near lateral margins, posterior margin roundingly excavated half distance to base, ovipositor very long with spines near apex. Male valve longer than preceding segment, attenuate to angled apex. Plates wider than valve at base, about one-third as long again as valve, almost parallel margined half their length, sharply attenuate to sharp slightly divergent black apices. Pygofer exceeding plates by about one-fourth their length.

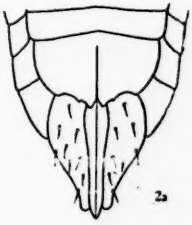
Holotype, female, allotype, male, Sabino Canyon, Arizona, July 14, 1932, R. H. Beamer. Paratypes as follows: 6 females and 11 males, Sabino Canyon, Arizona, June 22, 1933, R. H. Beamer; 7 males and 5 females, Sabino Canyon, Arizona, June 22, 1933, P. W. Oman; 2 males, Nogales, Arizona, June 25, 1933, R. H. Beamer; 2 females Patagonia, Arizona, June 24, 1933, R. H. Beamer. Paratypes in United States National Museum.

PLATE I


1a

1 Alapus marcidus


2 Flexamia decora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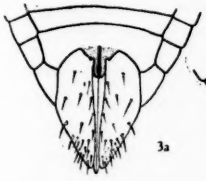
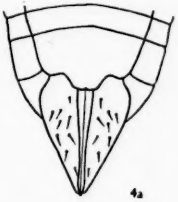
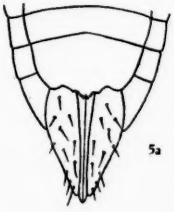

3a

3 Flexamia doeringae

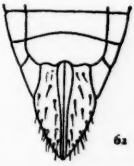

4a

4 Flexamia modica

5 Flexamia serrata


5a

6 Latalus curtus


6a

7a

7 Latalus mundus

8a

8 Latalus uncinatus

9 Latalus vagus

10a

10 Polyamia lobata

12 Polyamia tantilla

11 Polyamia nana

12a

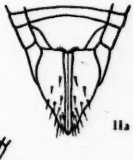
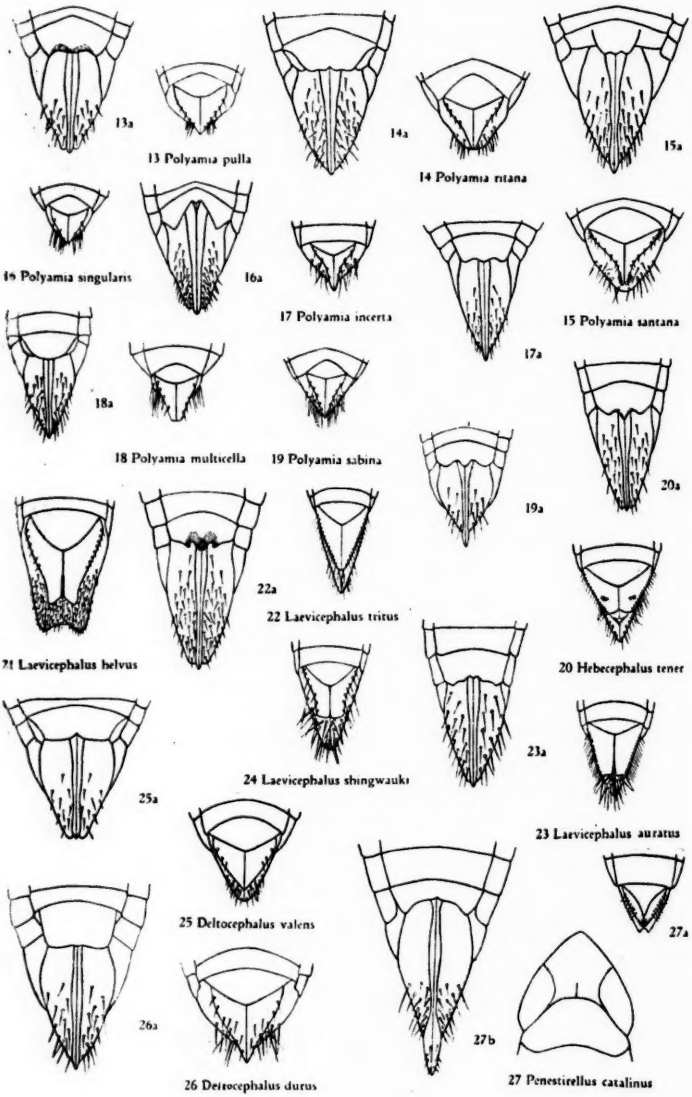

11a

PLATE II


13a
13 Polyamia pulla
14a
14 Polyamia ritana
15a
16 Polyamia singularis
16a
17 Polyamia incerta
17a
15 Polyamia santana
18a
18 Polyamia multicella
19 Polyamia sabina
19a
20a
22a
22 Laevicephalus tritus
21 Laevicephalus helvus
20 Hebecephalus tener
24 Laevicephalus shingwauki
23a
25a
23 Laevicephalus auratus
25 Deltocephalus valens
27a
26a
27b
26 Deltocephalus durus
27 Penestirellus catalinus

DERMAPTERA AND ORTHOPTERA IN THE KANSAS STATE COLLEGE COLLECTION.

MORGAN HEBARD

In 1931 when publishing on "The Orthoptera of Kansas"(1) we were informed that collections had been assembled by the Kansas State College, but too late to include them in that study. Their material has now been submitted to us and the following records of interest are here published. Considerable series of other species, publication of data on which would have added nothing to the scientific value of this paper, have been determined and returned to the Kansas State College. These collections were made largely in Riley County.

Most noteworthy is the fact that in that County are areas of Great Plains environment and several species have been secured which we had supposed were limited to western Kansas. In a large number of cases slight increases in the known distribution westward of eastern species are also noted.

Two species, **Boopedon auriventris** McNeill and **Melanoplus punctulatus** (Scudder) are added to the Kansas list. Both of these were mentioned by us in 1931, one as possibly, the other as probably occurring in the State. A typical male of the race **Melanoplus scudderi scudderi** is also here recorded for the first time, as are examples of the adventive species **Euborellia annulipes** and **Periplaneta americana.**

We are deeply indebted to Professors R. C. Smith and R. H. Painter for placing the present collections in our hands and for giving us information of value in preparing the present report.

DERMAPTERA

LABIDURIDAE

Euborellia annulipes (Lucas)

Topeka, Shawnee County, VIII, 11, 1927, (R. C. Smith), 9 juv. Newton, Harvey County, VIII, 25, (R. H. Painter), 1 juv.

This species is probably an introduction in Kansas, from which state it was not previously known.

LABIIDAE

Labia minor (Linnaeus)

Manhattan, Riley County, VII, 10, 1 male. Riley County, VII, 27 to IX, 21, 4 males, 2 females. Franklin County, 1925, (H. K. Gloyd), 1 female.

Generally established in the United States, this

(1) Proc. Acad. Nat. Sci, Phila., LXXXIII, pp. 119 to 227.

species was originally introduced from Europe.

ORTHOPTERA

BLATTIDAE

PSEUDOMOPINAE

Blattella germanica (Linnaeus)

Riley County, IX, 14, 1931, (Smith and Brown), 2 males. Manhattan, IV, 3, 1931, (M. W. George), 1 female.

Ischnoptera deropeltiformis Brunner

Manhattan, V, 6, 1925, (Zimmerman), 1 male, (Hebard Cln.); V, 13, 1910, (H. M. Smith), 1 male.

This is a northwestern limit for the species and a slight extension westward of its previously known range.

Parcoblatta bolliana (Saussure and Zehntner)

Pawnee County, VI, 15, 1931, (G. Fox), 1 male. Osborne, VI, 1930, (H. Nonamaker), 1 male.

Parcoblatta fulvescens (Saussure and Zehntner)

Riley County, (Popenoe), 1 male (medium size); VIII, 11, (F. Marlatt), 1 male (large for the species). This is a slight extension westward of the known range of **fulvescens** and also a northwestern limit.

Parcoblatta pensylvanica (DeGeer)

Jefferson County, IX, 1931, (J. H. Amun), 1 male. Riley County, V, 31, 1 male; VI, 20, (Kimball), 1 male. Manhattan, VII, 6, 1930, (E. Kingsley), 1 male.

BLATTINAE

Periplaneta americana (Linnaeus)

Manhattan, III, 20, 1929, (R. C. Smith) to XI, 22, 1926, 2 males, 1 female.

This is the first record for Kansas of this species, there probably introduced. It is a domiciliary pest.

Blatta orientalis Linnaeus

Manhattan, I, 15, 1932, (H. W. Gilbert), 1 large juv. male. Riley County, X, 17, 1931, (Neill), 1 male.

MANTIDAE

AMELINAE

Litaneutria minor Scudder

Reno County, IX, 22, (R. H. Painter), 1 male, (macropterous, dark).

Oligonicella scudderi (Saussure)

Onaga, Pottawatomie County, IX, 25, 1926, (Crevecoeur), 1 male.

MANTINAE

Stagmomantis carolina (Johansson)

Manhattan, X, 14, 1929, (L. M. Dean), 1 male.

This is a slight extension northward of the known range of this species.

PHASMIDAE

HETERONEMIINAE

Diapheromera persimilis Caudell

Pottawatomie County, VII, 19, 1931, (W. Wahl), 1 female (green). Manhattan, IX, 22, 1930, (R. H. Painter), 1 male, 1 female (Hebard Cln.); X, 4, 1930, (W. V. Redding; on prairie), 1 male. Medora, Reno County, X, 4, 1931, (Gilbert and Painter; in sand dunes), 1 male, 1 female.

Pottawatomie County and Manhattan are slight extensions northward of the known range of this race.

ACRIDIDAE

ACRYDINAE

Acrydium arenosum angustum Hancock

Manhattan, VI, 16, 1929, (L. M. Dean; insectary), 1 female (abbreviate). Riley County, IV and V, 1931, (Popenoe; Nonamaker), 1 male (abbreviate), 3 females (two subabbreviate, one caudate).

Paratettix cucullatus (Burmeister)

Manhattan, VI, 16, 1929, (L. M. Dean; insectary), 1 male, 2 females. Riley County, VI, 20 and 28, (Popenoe; Marlatt), 2 females.

ACRIDINAE

Pseudopomala brachyptera (Scudder)

Riley County, VI, 7, 1930, (D. A. Wilbur; in upland pasture burning plot), 1 female.

Mermiria neomexicana (Thomas)

Manhattan, VII, 29, 1921 to X, 17, 1930, (Wilbur; Smith), 12 male, 9 female. Riley County, VII, 22 to IX, 19, (Norton, Wahl etc.), 16 males, 18 females (nine females green, two females partly green, others brown).

This is evidently a common species in Riley County, but in eastern Kansas it is probably local in distribution.

Mermiria maculipennis macclungi Rehn

Riley County, VII, 19 to VIII, 28, (Dean; Popenoe; Marlatt; Wilbur), 11 females. Clark County, VII, 19, 2 females (atypical of this race).

Syrbula admirabilis Uhler

Manhattan, VIII, 15, 1931, (E. S. Fry; in alfalfa field), 1 male (Acad. Nat. Sci. Phila.). Riley County, IX, 10 to X, 10, (Neill; Avery), 2 males, 3 females.

Opeia obscura (Thomas)

Riley County, VIII, 23 to X, 14, (Dean; Popenoe; Avery; Hamon; Wilbur, native grasses on upland prairie), 1 male, 3 females (pair buff and brown, one female light and dark brown with green tegminal humeral band, one female same with green also on head,

species was originally introduced from Europe.

ORTHOPTERA

BLATTIDAE

PSEUDOMOPINAE

Blattella germanica (Linnaeus)

Riley County, IX, 14, 1931, (Smith and Brown), 2 males. Manhattan, IV, 3, 1931, (M. W. George), 1 female.

Ischnoptera deropeltiformis Brunner

Manhattan, V, 6, 1925, (Zimmerman), 1 male, (Hebard Cln.); V, 13, 1910, (H. M. Smith), 1 male.

This is a northwestern limit for the species and a slight extension westward of its previously known range.

Parcoblatta bolliana (Saussure and Zehntner)

Pawnee County, VI, 15, 1931, (G. Fox), 1 male. Osborne, VI, 1930, (H. Nonamaker), 1 male.

Parcoblatta fulvescens (Saussure and Zehntner)

Riley County, (Popenoe), 1 male (medium size); VIII, 11, (F. Marlatt), 1 male (large for the species). This is a slight extension westward of the known range of **fulvescens** and also a northwestern limit.

Parcoblatta pensylvanica (DeGeer)

Jefferson County, IX, 1931, (J. H. Amun), 1 male. Riley County, V, 31, 1 male; VI, 20, (Kimball), 1 male. Manhattan, VII, 6, 1930, (E. Kingsley), 1 male.

BLATTINAE

Periplaneta americana (Linnaeus)

Manhattan, III, 20, 1929, (R. C. Smith) to XI, 22, 1926, 2 males, 1 female.

This is the first record for Kansas of this species, there probably introduced. It is a domiciliary pest.

Blatta orientalis Linnaeus

Manhattan, I, 15, 1932, (H. W. Gilbert), 1 large juv. male. Riley County, X, 17, 1931, (Neill), 1 male.

MANTIDAE

AMELINAE

Litaneutria minor Scudder

Reno County, IX, 22, (R. H. Painter), 1 male, (macropterous, dark).

Oligonicella scudderi (Saussure)

Onaga, Pottawatomie County, IX, 25, 1926, (Crevecoeur), 1 male.

MANTINAE

Stagmomantis carolina (Johansson)

Manhattan, X, 14, 1929, (L. M. Dean), 1 male.

This is a slight extension northward of the known range of this species.

PHASMIDAE

HETERONEMIINAE

Diapheromera persimilis Caudell

Pottawatomie County, VII, 19, 1931, (W. Wahl), 1 female (green). Manhattan, IX, 22, 1930, (R. H. Painter), 1 male, 1 female (Hebard Cln.); X, 4, 1930, (W. V. Redding; on prairie), 1 male. Medora, Reno County, X, 4, 1931, (Gilbert and Painter; in sand dunes), 1 male, 1 female.

Pottawatomie County and Manhattan are slight extensions northward of the known range of this race.

ACRIDIDAE

ACRYDINAE

Acrydium arenosum angustum Hancock

Manhattan, VI, 16, 1929, (L. M. Dean; insectary), 1 female (abbreviate). Riley County, IV and V, 1931, (Popenoe; Nonamaker), 1 male (abbreviate), 3 females (two subabbreviate, one caudate).

Paratettix cucullatus (Burmeister)

Manhattan, VI, 16, 1929, (L. M. Dean; insectary), 1 male, 2 females. Riley County, VI, 20 and 28, (Popenoe; Marlatt), 2 females.

ACRIDINAE

Pseudopomala brachyptera (Scudder)

Riley County, VI, 7, 1930, (D. A. Wilbur; in upland pasture burning plot), 1 female.

Mermiria neomexicana (Thomas)

Manhattan, VII, 29, 1921 to X, 17, 1930, (Wilbur; Smith), 12 male, 9 female. Riley County, VII, 22 to IX, 19, (Norton, Wahl etc.), 16 males, 18 females (nine females green, two females partly green, others brown).

This is evidently a common species in Riley County, but in eastern Kansas it is probably local in distribution.

Mermiria maculipennis macclungi Rehn

Riley County, VII, 19 to VIII, 28, (Dean; Popenoe; Marlatt; Wilbur), 11 females. Clark County, VII, 19, 2 females (atypical of this race).

Syrbula admirabilis Uhler

Manhattan, VIII, 15, 1931, (E. S. Fry; in alfalfa field), 1 male (Acad. Nat. Sci. Phila.). Riley County, IX, 10 to X, 10, (Neill; Avery), 2 males, 3 females.

Opeia obscura (Thomas)

Riley County, VIII, 23 to X, 14, (Dean; Popenoe; Avery; Hamon; Wilbur, native grasses on upland prairie), 1 male, 3 females (pair buff and brown, one female light and dark brown with green tegminal humeral band, one female same with green also on head,

pronotum and dorsum of tegmina).

This in an eastern limit, substantiating as well that from Wichita which we were unable to verify in 1931.

Amphitornus coloradus (Thomas)

Riley County, one VII, 22, 1897, (Marlatt; Dean), 1 male, 2 females.

This is an eastern limit of continuous distribution, though the species is known from the sand areas of Illinois.

Eritettix simplex Scudder

Riley County, II, 9, 1929, (C. W. Withey), 1 half grown juv. male; IV, 26 to VI, 7, (G. A. Dean), 10 males, 18 females (four males and five females lacking supplementary carinae on pronotum); VII, 16, 1930, (D. A. Wilbur; upland pasture burning plot), 2 males, 1 female (one male lacking supplementary carinae on pronotum).

This species here undoubtedly winters in the immature stages, not in the egg as do the species which appear adult later in the season. The present series is typical, showing no approach toward **tricarinatus.**

Phlibostroma quadrimaculatum Thomas

Riley County, VIII, 6, (J. B. Norton; hilltops 3 to 4 miles west of Manhattan), 1 adult (abdomen missing).

This is an extension eastward of the known distribution of this Great Plains species. It is probably very local east of central Kansas, but is very generally distributed on the western plains.

Dichromorpha viridis (Scudder)

Riley County, X, 30, 1931, (T. B. Avery), 1 female (brown); VIII, 23 to IX, 27, 1930, (D. A. Wilbur; upland pasture burning plots), 4 males, 12 females (three males green dorsum, four females green, others brown).

Ageneotettix deorum (Scudder)

Riley County, IX, 1931, (A. Howard), 1 female (very large and robust).

Psoloessa texana Scudder

Manhattan, IV, 17, 1932, (R. H. Painter), 2 females, 1 large juv. female.

This locality is considerably east of the eastern limits of general distribution of this species; the previously easternmost known point of local distribution in Kansas was Medora. A northern Great Plains race of the species is represented, which will shortly be described by Rehn.

Boopedon auriventris McNeill

Riley Co., VI, 17 to VIII, 23, (Dean; Popenoe; Norton), 7 males, 9 females. Manhattan, VII, 23 to VIII, 23, 1933, (D. A. Wilbur), 16 males, 8 females.

This species was described from northwestern Arkansas and certain differences to distinguish **B. savannarum** Bruner, described from West Point, Nebraska, have been noted by us. Additional material from Dallas, Texas, shows that series to be indistinguishable from that from Nebraska and Kansas. The color differences are insufficient to warrant nominal recognition and the longer limbs of the Nebraska, Kansas and Texas specimens can certainly not justify recognizing **savannarum** as more than a geographic race and we believe will be found to be subject to sufficient variation to warrant repudiation of even racial rank. We therefore consider **savannarum** a synonym of **auriventris** and record the present series under that name.

Though known from very few localities, the species undoubtedly occurs over a wide area in eastern Nebraska, Kansas and Oklahoma, northeastern Texas, southwestern Iowa, western Missouri and northwestern Arkansas.

Aulocara elliotti (Thomas)

Riley County, VIII, 11 and 20, (F. Marlatt), 2 females.

This is a considerable extension eastward of the known range of **elliotti,** probably generally distributed only over the plains of western Kansas.

OEDIPODINAE

Arphia xanthoptera (Burmeister)

Linn County, VIII, 1931, (Miller), 2 males (wing disk orange). Iola, Allen County, VIII, 14, 1931, (D. Braun), 1 male (pronotal disk white, wing disk apricot yellow), (Hebard Cln.). Manhattan, IX, 26, 1931, (H. W. Gilbert), 1 male (wing disk orange). Riley County, VIII, 24 to X, 4, 1931, (Avery; Neill; Fox; Popenoe), 3 males, 1 female (wing disk bittersweet orange in two males, orange in one male, apricot yellow in female).

Manhattan is a northwestern limital point for this species which is common in Riley County and which probably occurs throughout eastern Kansas.

Chortophaga viridifasciata (DeGeer)

Oketo, Marshall County, XI, 8, 1928, (C. W. Withey; in wheat), 2 medium small juv. female (brown). Manhattan, IV, 17 to VI, 9, 1931, (Smith; Walker; Lamerson), 2 males, 2 females (one female green, others

brown). Riley County, IV, 28 to VII, 31, (Dean; Popenoe; Brown; Myers), 3 males, 8 females (one male, two females green, others brown).

Encoptolophus sordidus (Burmeister)

Oketo, Marshall County, XI, 8, 1928, (C. W. Withey; in wheat, 1 male. Manhattan, IX, 26, 1931, (H. W. Gilbert), 1 female.

Hippiscus rugosus (Scudder)

Riley County, IX, 17 to 30, 1931, (Hamon; Brown; Neill), 1 male, 3 females (wing disk pink in one female, orange in one male, yellow in two females).

Pardalophora apiculata (Harris)

Pottawatomie County, (W. Wahl), 1 female, (Acad. Nat. Sci. Phila.). Ashland, Riley County, IV, 26, 1928, (C. W. Withey; in wheat), 2 males. Manhattan, IV, 12 to V, 9, 1930, (Painter; Smith; Hanna), 1 male, 2 females.

Pardalophora haldemanii (Scudder)

Pawnee County, VII, 20, 1931, (G. Fox), 1 male (wing disk rich pink).

Dissosteira longipennis (Thomas)

Riley County, IX, 10, (F. Marlatt), 1 male.

This specimen was, we believe, a migrant. The limits of constant distribution of the species are probably west of Riley County.

Spharagemon bolli Scudder

Riley County, VII, 24, (G. A. Dean), 1 male, (Hebard Cln.).

This record constitutes a moderate extension westward of the known range of **bolli.**

CYRTACANTHACRINAE

Schistocerca americana americana (Drury)

Riley County, V, 26 to IX, 12, (Dean; Neall; Fox), 3 males, 6 females. A pair was taken in coitu on May 26, 1913.

This is a new western limital point, though in southern Kansas the insect has been reported from as far west as Reno County.

Hesperotettix viridis pratensis Scudder

Riley County, VII, 16 to X, 3, 1930, (D. A. Wilbur; upland in fertilizer plots, few in pasture burning plots and in height of grass clipping plots), 10 males, 12 females.

Like **Trimerotropis pallidipennis salina** McNeill, this insect has been shown by Montana material to there almost certainly intergrade with the typical race, but in the states which include the eastern borders of the

Great Plains no trace of intergradation has ever been found, even though in parts of these states in each case both races are present.

Melanoplus scudderi scudderi Uhler

Riley County, VIII, 20, 1 male. See comments under **scudderi latus.**

Melanoplus scudderi latus Morse

Riley County, VIII, 11 to IX, 23, (Dean; Popenoe), 7 males, 16 females.

Though four males are typical of this race in form of the cerci, three show some divergence toward **scudderi scudderi,** and one recorded above is typical of that race in this feature. All, however, have the general appearance of **scudderi latus** and in Riley County, though evidently in the zone of intergradation, that race apparently dominates.

Melanoplus differentialis (Thomas)

Pottawatomie County, VII, (W. Wahl), 1 female (melanistic). Manhattan, VIII, 13, 1931, (E. C. Smith; in alfalfa), 1 male, 1 female. Riley County, (Popenoe), 1 female (melanistic); X, 14, 1931, (T. E. Avery), 1 female.

Melanoplus punctulatus punctulatus (Scudder)

Onaga, Pottawatomie County, VII, 26, 1920, (Crevecoeur), 1 male.

This is the first Kansas record and a western limital point in the distribution of this insect.

Melanoplus fasciatus (F. Walker)

Riley County, VII, 24, (G. A. Dean), 1 male, 1 female.

In Kansas this is a western limit for the species which, however, is again carried southward to this latitude in the Rocky Mountains.

Melanoplus foedus fluviatilis Bruner

Riley County, VIII, 12, (G. A. Dean), 1 female.

Phoetaliotes nebrascensis (Thomas)

Riley County, VIII, 1 to XI, 6, (Dean; Avery; Popenoe; Marlatt; Wilbur, in fertilizer plot), 6 males, 14 females (two females macropterous). Manhattan, IX, 13, 1932, (R. H. Painter), 1 male.

Though generally distributed only in western Kansas, we now believe that Bruner's record from Topeka, which we considered accidental in 1931, is based on a specimen. like those here recorded, coming from a local area of favorable environment. The species is known from the sand areas of Illinois and extreme northwestern Indiana.

TETTIGONIIDAE

PHANEROPTERINAE

Arethaea gracilipes constricta Brunner

Onaga, Pottawatomie County, VII, 15, 1930 and VIII, 9, 1924, 2 males, 1 female. Riley County, VII, 26 to X, 26, (Marlatt; Wilbur, upland in fertilizer plot and in pasture burning plot), 2 males, 1 female.

Onaga constitutes a short eastward extension of the known range of this insect.

Amblycorypha oblongifolia (DeGeer)

Riley County, 1 male.

Amblycorypha parvipennis brachyptera Ball

This is the insect which Rehn and the author have heretofore recorded as **Amblycorypha iselyi** Caudell. Dr. E. D. Ball has recently brought to our attention the fact that he inadvertently described this insect from Ames and northwestern Iowa in 1897(2). Caudell's **iselyi,** described in 1904(3), is therefore a synonym. Further study of our series shows that **parvipennis** (Stal), described in 1876, is a valid species and not a race of **rotundifolia** (Scudder) as was incorrectly stated by Rehn and Hebard in their revision of the genus in 1914(4) and that **brachyptera** is a northern race of **parvipennis.**

Onaga, Pottawatomie County, (Crevecoeur), 1 female. Franklin County, VI, 29, 1922, (H. K. Gloyd), 1 male. Onaga is a western extension of the known range of this race which, however, to the south is known as far west as Sedgwick County.

Microcentrum rhombifolium (Saussure)

Pottawatomie County, VIII, (W. Wahl), 1 female. Manhattan, IX, 6, 1929, (L. M. Dean), 2 females.

This is a short extension of the known range of the species westward.

PSEUDOPHYLLINAE

Pterophylla camellifolia (Fabricius)

Independence, Montgomery County, VII, 1 male, (Hebard Cln.).

This is a western limital point for **camellifolia.**

COPIPHORINAE

Neoconocephalus retusus (Scudder)

Manhattan, V, 24, 1904, 1 female.

This is a short extension west for the species, but constitutes a northwestern limit as well.

(2) Proc. Iowa Acad. Sci., IV, p. 237.

(3) Jour. New York Ent. Soc., XIII, p. 50.

(4) Trans. Amer. Ent. Soc., XL, pp. 339 and 340.

Neoconocephalus nebrascensis (Bruner)

Franklin County, VIII, 17, 1922, (H. K. Gloyd), 1 female (green), (Hebard Cln.).

This record constitutes another western limital point in the species distribution.

Neoconocephalus ensiger (Harris)

Riley County, VII, 7 to 26, 1930, (D. A. Wilbur; 2 on lowland prairie in native grasses, 4 in upland pasture burning plot and fertilizer plot), 4 males, 2 females (one female light brown, others green).

This is another point on the known western limits of the species.

CONOCEPHALINAE

Orchelimum sylvaticum McNeill

In recent studies on the Orthoptera of Illinois we have found **O. calcaratum** Rehn and Hebard to be a synonym of **sylvaticum.**

The species was recorded as **calcaratum** by us in 1931 from Kansas, west to Smith, Osborn and Grant Counties.

Orchelimum nigripes Scudder

Manhattan, IX, 24, 1928, (L. M. Dean), 2 males, 1 female. Riley County, VIII, 29, 1930, (D. A. Wilbur; from pasture grasses in rich bottom), 1 female.

This is a western limital record.

Conocephalus brevipennis (Scudder)

Riley County, IX, 6, (E. E. Faville), 1 male.

This is a short extension westward of the known distribution of this species.

Conocephalus nemoralis (Scudder)

Manhattan, X, 15, 1926, (R. H. Painter), 2 females.

The distribution of **nemoralis** is hereby similarly extended briefly westward.

Conocephalus nigropleurum (Bruner)

Riley County, IX, 1896, (J. B. Norton; beaten from **Polygonum**), 1 male.

This is a southwestern limit and a short extension of the previously known range of the insect.

Conocephalus saltans (Scudder)

Manhattan, IX, 26, 1931, (H. W. Gilbert), 1 male, 1 female (brachypterous, sides green).

DECTICINAE

Pediodectes haldemanii (Girard)

Manhattan, VII, 26, 1929, (R. H. Painter), 2 females, (Hebard Cln.). Riley County, VII, 27 to VIII, 24, (Popenoe; Norton), 4 males, 1 female.

Manhattan is an eastern limit, the species already

having been taken slightly more to the east in central and southern Kansas.

RHAPHIDOPHORINAE

Ceuthophilus divergens Scudder

Riley County, VII, 13, (J. B. Norton), 1 male, (Hebard Cln.). This is a short extension westward of the known range of the species.

Ceuthophilus pallidus Thomas

Oketo, Marshall County, VII, 19, 1928, (C. W. Withey; under shocks in wheat field), 1 juv. male. Manhattan, VII, 26, 1929, (R. H. Painter), 1 male, 1 large juv. female.

Daihinia brevipes Haldeman

Medora, Reno County, V, 29 and VII, 4, (McColloch and Smith; in sand dunes), 1 male, 1 female, (Hebard Cln.). Stafford County, IV, 30, (R. H. Painter; in salt marsh), 1 large juv. female.

GRYLLIDAE

GRYLLINAE

Miogryllus verticalis (Serville)

Riley County, III, 21,(Kimball; under rocks), 1 male; V, 15, (K. V. Engle), 1 juv. female; VII, 21, (J. B. Norton; under stones on Bluemont hill), 1 female.

This is a short extension westward of the known range of the species.

NEMOBIINAE

Nemobius carolinus carolinus Scudder

St. George, Pottawatomie County, VIII, 27, 1 female (brachypterous). Riley County, VIII, 27 and 28, (J. B. Norton), 2 males (brachypterous). Manhattan, X, 8, 1932, (R. H. Painter), 1 male (brachypterous).

Manhattan constitutes another slight extension westward of this race's known range.

Nemobius bruneri Hebard

Wathena, Doniphan County, VII, 1, 1926, (L. M. Gates), 1 female (macropterous), (Hebard Cln.). Riley County, VIII, 27 to IX, 10, (J. B. Norton), 2 males, 3 females (brachypterous).

This is also a slight extension westward of the known range of **bruneri.** Specimens before us from Springfield, South Dakota, show also a new northwestern limit for the species.

OECANTHINAE

Oecanthus angustipennis Fitch

Manhattan, VIII, 11, 1931, (R. C. Smith), 1 male. Riley County, X, (Popenoe), 2 females. Franklin County, IX, 17, 1925, (H. K. Gloyd), 1 male, (Hebard Cln.).

Manhattan is a slight extension westward of the known range of **angustipennis.**

Oecanthus niveus (DeGeer)

Pottawatomie County, (W. Wahl), 1 male.

This record extends slightly westward of the known area of continuous distribution of **niveus** in Kansas. The species, though occurring in the West, is probably absent from the Great Plains.

Oecanthus nigricornis quadripunctatus Beutenmuller

Riley County, VIII, 16 to IX, 3, (Norton), 1 male, 1 female (Fulton's Classes 3 and 5). Medora, Reno County, X, 3, 1931, (H. W. Gilbert), 1 female (Fulton's Class 1 (antennae immaculate)).

Oecanthus nigricornis argentinus Saussure

Riley County, VI, 20 to IX, 25, (Norton; Popenoe; Smith; Faville: a large number on **Grindelia**), 12 males, 27 females (Three are Fulton's Class 7, all others strongly Class 8).

Oecanthus latipennis Riley

Onaga, Pottawatomie County, (Crevecoeur), one male, (Hebard Cln.).

Neoxabea bipunctata (DeGeer)

Onaga, Pottawatomie County, VII, 8, 1929, (Crevecoeur), 1 male, (Hebard Cln.).

This is a western limital point but the species has also been recorded from Morris County, slightly west of south.

TRIGONIDIINAE

Anaxipha exigua (Say)

Topeka, Shawnee County, VIII, 24, (Popenoe), 2 females.

This record constitutes a very slight extension westward of the known range of the species.

GRYLLOTALPINAE

Gryllotalpa hexadactyla Perty

Easton, Leavenworth County, VIII, 6, (T. C. Craig), 1 female (brachypterous). Manhattan, VIII, 11, 1928, (R. H. Painter), 1 female (macropterous). Riley county, IX, (M. Dunlap), 1 male (brachypterous), (Hebard Cln.). Franklin County, VIII, 4, 1922, (H. K. Gloyd), 1 female (macropterous), (Hebard Cln.). Madison, Greenwood County, VIII, 14, 1928, (R. H. Painter), 1 female (macropterous).

Gryllotalpa major Saussure

Riley County, IV, 17, 1931, 1 female; V, 5, (G. A. Dean), 1 male, (Hebard Cln.). Stockton, Rooks County, VI, 1, 1921, (H. V. Toeffer), 1 female, (Hebard Cln.).

Stockton extends the known distribution of this species in Kansas a considerable distance westward.

TRIDACTYLINAE

Tridactylus minutus Scudder

Onaga, Pottawatomie County, V, 21, 1926, (Crevecoeur), 1 male, 3 females. Manhattan, V, 12, 1920, R. H. Painter), 3 males, 1 female.

EDWIN A. POPENOE

Edwin A. Popenoe was born in Centerville, Ohio, July 1, 1853. He moved with his parents to Illinois in 1860, where he remained nine years and then came with his parents to Topeka, Kansas. He entered Washburn College and graduated in 1876.

In July, 1879, Professor Popenoe was elected to the chair of Botany, Horticulture and Entomology at the Kansas State Agricultural College, and gave the courses in these subjects. From 1883-1894 the department was known as the Department of Horticulture and Entomology, and Professor Popenoe gave the courses in Entomology and Horticulture. In 1887, at which time the Kansas Agricultural Experiment Station was established, Professor Popenoe also became the Horticulturist and Entomologist of the Kansas Agricultural Experiment Station. In 1894, due to the rapid growth and expansion of the college work, it was necessary to add new departments, and Professor Popenoe became head of the Department of Entomology and Zoology, which position he occupied until July, 1897. In July, 1897, he resigned, but two years later he was again appointed Professor of Horticulture and Entomology. In the reorganization work at the college in 1901, Professor Popenoe again became head of the Department of Entomology and Zoology, which position he filled until July 1, 1907, when he resigned to live on his farm three miles south of Topeka. Professor Popenoe died at his farm home, November 17, 1913.

Professor Popenoe was a man of broad education, high culture and engaging personality. As an investigator he was accurate, thorough, and had the true scientific spirit. As a teacher of Entomology, Horticulture and Zoology, he interested many students who have reached not only the highest positions in their respective fields, but also have contributed much to the agricultural and biological sciences. His memory is cherished by all who had the good fortune to secure his friendship.

GEO. A. DEAN.

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